

REMARKS/ARGUMENTS

Claims 23-33 are pending.

Claim 27 is rejected under 35 U.S.C. § 112, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 23-25 and 27-33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Napolitano et al., U.S. Patent No. 6,301,605 in view of Galand et al., U.S. Publication Application No. 2004/0042402.

The undersigned would like to express his appreciation for the examiner's time and attention during a telephonic interview conducted on February 8, 2006 to discuss the cited references.

As for the Section 112 rejection, claim 27 has been amended to overcome the rejection regarding improper antecedent basis of a recited limitation.

Claim 23, as originally filed, recited in part "a storage system comprising a plurality of I/O ports for connection to a communication network." Napolitano, however, does not show "a storage system comprising a plurality of I/O ports." The cited column 3, lines 55-60 appears to be a summary of Fig. 3 and mentions a "low latency interface" which would correspond to interface 302 in Fig. 3. Likewise, a review of the description of Fig. 3 does not show "a storage system comprising a plurality of I/O ports." Fig. 3 shows a single interface 302 between the file array adapter 350 and the hose 310.

Referring to the pending specification, the illustrative embodiment of Fig. 1 clearly shows separate connections (via port 107 and port 108) of a storage device 101 to a communication network 106. Claim 23 has been amended to recite "a first I/O port" and "at least a second port separate from the first I/O port." As amended, claim 23 distinguishes over Napolitano because the reference does not show a first I/O port and a second I/O port separate from the first I/O port.

Independent claims 29 and 30 have been similarly amended.

During the interview, an inquiry was made whether the I/O stack 100 constituted “a plurality of I/O ports.” The undersigned explained that the I/O stack 100 comprises a hierarchy “drivers” which are software components that execute in the operating system in the host. Drivers are not I/O ports; and even if they were, the drivers shown in Fig. 1 clearly reside in the host, not the storage system. Column 8, lines 56-65 describes the I/O stack. Fig. 1 therefore does not in any way show or even suggest the originally recited “plurality of I/O ports”, or the presently recited “a first I/O port” and “at least a second port separate from the first I/O port.”

The claims further recite, in part, that the storage system comprises “a plurality of data paths” and that “each data path [is] selectively connectable between one of the logical disks and one of the I/O ports.” The Office action cited Napolitano’s discussion of “efficient mapping” for showing the recited selective connection. As recited in the claims, the storage system can connect one of its plural data paths between a logical disk and an I/O port, and it can do it in a selective manner wherein any one of the logical disks can be connected to any one of the I/O ports.

Napolitano’s “efficient mapping” has nothing to with data paths connecting a logical disk to a logical port. The portion cited in the Office action describes the idea of “container”, col. 8, lines 23-25:

“The container manager 482 is a software entity that manages containers and oversees certain operations, such as parity calculations. As described further herein, containers consist of space from one or more disks and are the logical units of storage for the file system, as well as the units of data organization for, e.g., various RAID implementations; this allows the container manager to efficiently map file system addresses to disk addresses.”

The mapping that Napolitano is describing is merely a mapping of an address of a file in their file system to the actual location on a disk. There is no connecting a data path from an I/O port to a logical unit; and for a given file at a given time its location on the disk is fixed, so there is nothing selective about a file location and its location on the disk. Respectfully, this part of Napolitano’s teaching has no bearing on the recited “plurality of data paths” where “each data

path [is] selectively connectable between one of the logical disks and one of the I/O ports.” Napolitano is describing file addresses and disk addresses, whereas the claim limitation is directed to connections between I/O ports of a storage system and logical disks in that storage system.

The claims also recite, in part, an allocator an allocator to allocate one of the data paths between one of the logical disks and one of the I/O ports based upon a data rate capability of said one data path to thereby provide a desired quality of service. The Office action correctly notes that Napolitano does not disclose an allocator.

The reference to Galand was cited for allegedly showing such an allocator. Galand describes packet switching among nodes in a switching transmission system such as a LAN (e.g., Fig. 2, paragraph [0073]), and in particular Galand describes the notion of maintaining alternate paths between nodes. See Abstract and paragraphs [0050-0055], for example. The Office action cited paragraphs [0082-0085]. However, there seems to be a misread of the description given in paragraphs [0082-008] because this passage simply describes storing the alternate paths in some storage. Paragraph [0209] discloses storing alternate paths in a database (APD). Galand does not show that the alternate paths are the recited “data paths” within a storage system between I/O ports of the storage system and logical units in the storage system; rather, Galand’s paths are links between nodes in a communication network.

It is noted that Galand discloses factors which indicate path selection based on quality of service. Galand, however, does not disclose nor suggests path selection in a storage system.

Since Napolitano does not show an allocator and Galand likewise does not show an allocator (contrary to the Office action’s assertion), the references considered together also fail to teach the recited allocator. Moreover, Galand fails to show or suggest the other recited limitations which Napolitano fails to teach. The Section 103 rejection of the claims is believed to be overcome.

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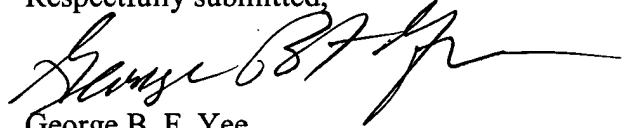
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CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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